REMARKS

I. INTRODUCTION

In response to the Office Action dated December 29, 2006, claims 1 and 5 have been amended. Claims 1-7 remain in the application. Entry of these amendments, and re-consideration of the application, as amended, is requested.

II. CLAIM AMENDMENTS

Applicants' attorney has made amendments to the claims as indicated above. These amendments were made solely for the purpose of clarifying the language of the claims, and were not required for patentability or to distinguish the claims over the prior art.

III. PRIOR ART REJECTIONS

On pages (2)-(5) of the Office Action, claims 1-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,862,710 (Marchisio) in view of U.S. Publication 2001/0047372 (Gorelik).

Applicants' attorney respectfully traverses these rejections. Specifically, the Applicants' amended claims are patentable over the references, because the claims contain limitations not taught by the references.

Nonetheless, the Office Action asserts the following:

> 2. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchisio (U.S. patent application No. 6,862,710 B1) in view of Gorelik et al. (U.S. patent application publication No. 200.1 10047372 A1).
>
> As to claim 1, Marchisio teaches a computer-implemented method of accessing information, from a collection of data comprising:
>
> receiving a query (see column 9, lines 10- 12, figures 2, 8, and 10);
>
> generating an inverse index of the collection of data (see column 9, lines 24-25, and see figure 3); and
>
> generating results to the query in conjunction with the inverse index by performing a search request of the inverse index (see column 17, lines 1-5).
>
> Marchisio does not distinctly disclose:
>
> (a) data that is augmented with category hierarchy information; and
>
> (b) using the results from the search request with a search request of a relational database management system, wherein a match to an item in the inverse index also retrieves corresponding category hierarchy information, which is then mapped to items in the relational database management system.

Gorelik et al. teaches (a), see paragraph 0036 and (b), see paragraph 0039 0041.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Marchisto to include the teachings of Gorelik et al. because these teachings would allow the user to map search results from a query that returns XML data into a relational database for storage and later retrieve those results either in XML or relational format.

As to claim 2, Marchisio as modified, teaches wherein generating the inverse index comprises:

storing a canonical non-terminal representation of the data in the inverse index (see Marchisio, column 9, lines 39-42, and see figures 3-4).

As to claim 3, Marchisio as modified, teaches wherein generating the inverse index further comprises:

storing the category hierarchical information generated from the collection of data with the inverse index'(see Marchisio, column 17, lines 7-10 and 39-45);

applying a parser and grammar rules to the collection of data to produce a canonical non-terminal representation of the data (see Marchisio, column 9, lines 30-35).

As to claim 4, Marchisio as modified, teaches wherein the generating results comprises:

applying the parser and the grammar rules to the query to produce a query canonical form (see Marchisio, column 9, lines 30-35); and

matching the query canonical form to the canonical non-terminal representation of the data in the inverse index (see Marchisio, column 8, lines 23-28).

As to claim 5, Marchisio teaches a computer program, residing on a computer-readble medium, comprising instructions for causing a computer to:

receive a query (see column 9, lines 10-12 and see figures 2, 8, and 10);

generate an inverse index of a collection of data (see column 9, lines 24-25 and see figure 3); and

generate results to the query in conjunction with the inverse index by performing a search request of the inverse index (See column 17, lines 1-5).

(a) data that is augmented with category hierarchy information; and

(b) using results from the search request with a search request of a relational database management system, wherein a match to an item in the inverse index also retrieves corresponding category hierarchy information, which is then mapped to items in the relational database management system.

Gorelik et al. teaches (a), see paragraph 0036 and (b), see paragraph 0039 0041.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Marchisio to include the teachings of Gorelik et al. because these teachings would allow the user to map search results from a query that returns XML data into a relational

database for storage and later retrieve those results either in XML or relational format.

As to claim 6, the applicant is directed to the citations made in the rejection of claim 3 above.

As to claim 7, the applicant is directed to the citations made in the rejection of claim 4 above.

The pertinent portions of Marchisio and Gorelik referred to above are reproduced below:

Marchisio: column 9, lines 10-12 (actually, lines 10-20)

Client GUIs (Graphical User Interfaces) 25 permits users to pose queries, browse query results, and inspect documents. In an illustrative embodiment, GUI components may be written in the Java programming language provided by Sun Microsystems, using the standard JDK 1.1 and accompanying Swing Set. Various visual interface modules may be employed in connection with the GUI clients 25, for example executing in connection with the Sun Solaris operating system of Sun Microsystems, or in connection with the Windows NT, Windows 95, or Windows 98 operating systems of Microsoft Corporation.

Marchisio: Figures 2, 8, and 10

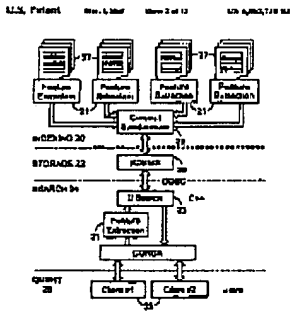

FIG. 2

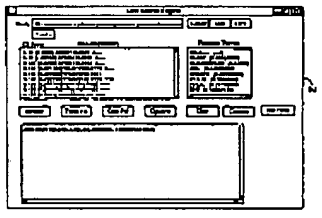

FIG. 8

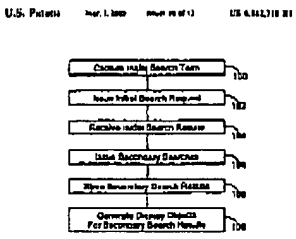

FIG. 10

Marchisio: column 9, lines 24-25 (actually, lines 22-42)

As shown in FIG. 3, a feature extraction module 21 comprises a parser module 31, a stopwording module 33, a stemming module 35, and a module for generating inverted indices 37. The output of the indexing process using the feature extraction module 21 includes a number of inverted files (Hartman et al, 1992, No. 15 in Appendix A), shown as the "term-document" or "information" matrix 39. The parser 31 removes punctuation and records relative word order. In addition, the parser 31 employs a set of rules to detect acronyms before they go through the stopword 33 and stemmer 35 modules. The parser 31 can also recognize specific HTML, SGML and XML tags. The stopword 33 uses a list of non-diagnostic English terms. For purposes of example, the stemmer 35 is based on the Porter algorithm (described in Harman et al, 1992, No. 15 in Appendix A). Those skilled in the art should recognize that alternative embodiments of the disclosed system may employ stemming methods based on successor variety. The feature extraction module provides functions 37 that generate the inverted indices by transposing individual document statistics into a term-document matrix 39.

Marchisio: Figure 3

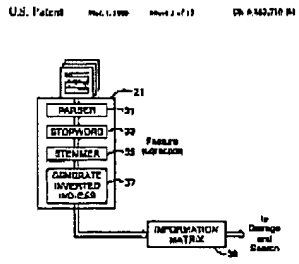

FIG. 3

Marchisio: column 17, lines 1-5 and 7-10 (actually, lines 1-14)

At step 102, the disclosed system issues an initial search request, via a search engine, using an initial search query consisting of the initial term. At step 104, a plurality of terms that are related to the initial search query are received as search results from the search engine. These related terms may be, for example, sorted in decreasing order of correlation to the initial term. The disclosed system may attach a relevance level to each one of a predetermined number of the initial search result terms, the relevance level reflecting a correlation to the initial term, and these relevance levels may be displayed to the user. In an illustrative embodiment, the relevance levels reflect a lexical correlation between the initial term and each respective one of the initial search result terms.

Marchisio: column 17, lines 39-45

The disclosed system then stores a number of secondary search result document weights at step 108, for example in decreasing order. The secondary search result document weights are received in response to the secondary searches issued at step 106, and the decreasing order in which they are stored places the documents that are most related to the secondary search query a the beginning of the list.

Gorelik: Paragraph 0036

[0036] Business documents used to exchange data between software systems within an enterprise or between enterprises need to be represented as complex hierarchical documents. The industry and the research community use well-known representations such as EDI and XML to capture and represent such documents. The system described herein provides methods for mapping such documents to a Nested Relational format, methods for transforming and manipulating of these documents represented using the Nested Relational Data Model, converting such documents to relational format and mapping them to

multiple relational tables, and a method of converting the data in a nested relational format back to an external hierarchical format such as XML.

Gorelik: Paragraphs 0039 0041

[0039] One source of data for a nested table is the result of a query using the values in the related row in the parent table. As used herein, "parent table" refers to a table within which another table is nested and "child table" or "nested table" refers to a table that is nested in a column of a parent table. A nested table is said to have a relationship with the table within which it is nested and where levels are associated with tables, a parent table would have a level that is designated with a number one higher than the child tables nested in that parent table. For example, FIG. 4 shows a parent table 10, a nested (child) table 12 one level below table 10 and nested tables 14(a)-(b) that are nested in table 12 and are two levels below table 10.

[0040] Preferably, a unique instance of each nested table exists for each row at each level of a relationship. As illustrated in FIG. 5, each row at each level can have any number of columns containing nested tables.

[0041] FIG. 6 shows various aspects of a database system 100 that handles NRDM data. System 100 is shown comprising a metadata mapper 104 that maps DTD 102 w/hierarchical structures to NRDM schema that are stored in schema storage 106. These components are shown as being part of a preprocessing section, with other portions being part of a real-time section, but it should be understood that all of the process or none of the processing might be done in real-time without departing from the essence of the invention. Notwithstanding that caveat, the descriptions below reference an example wherein DTDs are converted to NRDM schema and stored and documents are converted by system 100 in real-time after such conversion.

Contrary to the Office Action's assertion, the combination of Marchisio and Gorelik does not teach or suggest Applicants' claimed invention of generating an inverse index of the collection of data that is augmented with category hierarchy information. In addition, the combination of Marchisio and Gorelik does not teach or suggest Applicants' claimed invention of generating results to the query in conjunction with the inverse index by performing a search request of the inverse index, and using results from the search request with a search request of a relational database management system, wherein a match to an item in the inverse index also retrieves corresponding category hierarchy information stored with the inverse index, and the category hierarchy information is then mapped to items in the relational database management system in performing the search request of the relational database management system.

Instead, the above portions of Gorelik merely describe the use of nested tables in a nested relational format, wherein a nested table merely refers to a child table that is nested in a column

of a parent table. Nonetheless, nested child tables within column tables have no relation to inverse indexes that are augmented with category hierarchy information, wherein a match to an item in the inverse index also retrieves corresponding category hierarchy information stored with the inverse index, and the category hierarchy information is then mapped to items in the relational database management system in performing the search request of the relational database management system.

In addition, the only hierarchy referred to in the above portions of Gorelik is the hierarchy found within a DTD (Document Type Definition, which is a document that describes the structure of a document written in XML), that are mapped into a database schema used by a Nested Relational Data Model (NRDM). However, XML DTDs and NRDM schemas do not comprise category hierarchy information, and XML DTDs and NRDM schemas are not stored with inverse indexes. Consequently, mapping DTDs to NRDM schemas does not teach or suggest retrieving category hierarchy information stored with inverse indexes, and then mapping the category hierarchy information to items in the relational database management system in performing the search request of the relational database management system.

Finally, the above portions of Marchisio do not teach or suggest that category hierarchy information is stored with the inverse index. Instead, the above portions of Marchisio merely describe how a plurality of terms that are related to an initial search query are received as search results from the search engine, and how these related terms may be sorted in decreasing order of correlation to the initial term. In addition, the above portions of Marchisio merely describe the system storing secondary search result document weights in decreasing order, which places the documents that are most related to the secondary search query at the beginning of a list.

Consequently, the combination of Marchisio and Gorelik does not teach or suggest Applicant's independent claims. Moreover, the various elements of Applicant's claimed invention together provide operational advantages over the combination of Marchisio and Gorelik . In addition, Applicant's invention solves problems not recognized by the combination of Marchisio and Gorelik .

For example, in Applicants' invention, the RDBMS is used with the inverse index to respond to queries that involve a combination of structured information stored in the RDBMS and unstructured information existing in free text. The search of the unstructured information is performed using the inverse index, while the search of the structured information is performed

using the results of the inverse index search. However, in Applicants' invention, the free text information in the inverse index may not always correspond to individual items in the RDBMS. In general, there may be many items in the inverse index that correspond to categories of items in the RDBMS. In order to improve the efficiency of searches involving such items in the inverse index, the inverse index is further augmented with category hierarchy information. Thus, a match to an item in the inverse index will also retrieve corresponding category hierarchy information, which can then be mapped to items in the RDBMS.

Thus, Applicant's attorney submits that independent claims 1, 16 and 32 are allowable over the references. Further, dependent claims 2-15 and 17-31 are submitted to be allowable over the references in the same manner, because they are dependent on independent claims 1 and 16, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-15 and 17-31 recite additional novel elements not shown by the references.

IV. CONCLUSION

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited.

Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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